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Remaking the material fabric of the city: 'Alternative' low carbon spaces of transformation or continuity?

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ABSTRACT

This article is about re-making the material fabric of the city and the role that space plays in this. There are many ways of understanding the remaking of the city, including a range of often diverse 'alternative' initiatives which are enacted by neighbourhood, voluntary and civil society groups. We address the construction of 'alternative' urban low carbon spaces and whether these result in transformation of or continuity with dominant ways of thinking about remaking the city. Drawing on examples in Greater Manchester, UK, the article argues that, often despite the intention to promote forms of localist values and strategies as alternatives to dominant accounts of remaking the city, the hand of dominant and particularly state interests is critical in shaping 'alternative' spaces and strategies. This tension – between dominant and alternative – is illustrated through a five-fold typology of the role of space in alternative strategies of remaking the city.

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1. Introduction

We live in an era where there are widespread efforts to purposively make new cities and to remake existing cities. This view is concerned not with the incremental and ongoing remaking of the city

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but with its transformation. These efforts are primarily responses that can be understood within the broad frame of sustainable urban development, where 'many new categories of 'cities' have entered the policy discourse: 'sustainable cities'; 'green cities'; 'digital cities'; 'smart cities'; intelligent cities'; 'information cities'; 'knowledge cities'; 'resilient cities'; 'eco cities'; 'low carbon cities'; 'liveable cities'; and even combinations, such as 'low carbon eco cities' and 'ubiquitous eco cities' which 'often appear to be used interchangeably by policy makers, planners and developers'. Though these 'can be seen as repeated attempts to articulate, specify, and even popularise, the concept of sustainable urban development', and there are interrelationships between them, they can be seen as distinctive categories that each capture 'a different view of what the city is and how it works, with respect to the role of citizens and the way they relate to the governance of the city, with respect to the interactions between the city and its natural environment, and with respect to the role of urban infrastructure systems and services in the city's economy and liveability' (de Jong et al., 2015, pp. 1, 2, 12).

Our interest is in the organisation of cities, the ways this is seen to contribute to unsustainable levels of greenhouse gas emissions and how their remaking can promote lower carbon futures. A dominant response to this challenge has shaped a discourse where new eco-cities are designed on the principle of the lower carbon material and social organisation of cities. In already existing cities, this principle is 'retrofitted' to the built environment and to the infrastructures and resources that flow through them.

Though there are various manifestations of both eco-cities (Joss and Molella, 2013) and strategies to retrofit existing cities (May et al., 2013) there are common principles that characterise the dominant strand of both responses. Most notably, these are techno-economic responses where lower carbon energy, water, waste and transportation technologies are configured in relation to a city and presented in terms of their cost and contribution to reducing greenhouse gas emissions, presented as bounded spaces and within which there is often a non-active role for people (Hodson and Marvin, 2010; Joss and Molella, 2013). They are interventions that are 'measurable', designed by coalitions of local and national policymakers, architects, utilities and corporate technology providers. Some of these social interests that seek to re-make urban space are locally embedded but many are not and these often have a 'top-down' view of organising the city. In doing this, these often narrowly constituted coalitions produce visions of how the city is made and re-made (Hodson and Marvin, 2013; Rapoport, 2014).

Within this dominant discourse there is spatial unevenness both between and within cities. Eco-city developments, for example, whilst often characterised as bounded spaces are not only produced by coalitions of geographically disparate relationships but also often rely on new interdependencies within the wider regional geographies in which they are embedded (Hodson and Marvin, 2010). Similarly, purposive retrofitting strategies have promoted various zones and corridors in high-value areas of the city (May et al., 2013). Yet what is frequently most telling about the dominant approach to remaking the city is how it is characterised as being *the* way of responding to the challenges posed by the need to reduce greenhouse gas emissions.

It is helpful to explore alternatives to remaking the city that go beyond dominant responses. There are potentially multiple pathways in remaking the city as lower carbon; this is bound up with a spatial politics. There are many new forms of political space where climate change and decarbonisation initiatives intervene to try and reconfigure alternative energy, water, waste and transport systems (Castán Broto and Bulkeley, 2012, 2013). The possibilities arising from intervening in such systems are bound together with interventions in the organisation of space (a relational view), with what and where space is organised (a geographical view) and the effects that these have.

There are numerous ways that we can understand alternative new forms of political space. There has been engagement with efforts to construct new political spaces as strategies of relocating economies and resource flows (North, 2010) and as part of bottom-up efforts to build transition communities and towns (Mason and Whitehead, 2012). What is apparent is that these approaches to remaking the city aspire to be less managerial and technocratic than dominant approaches – which seek to apply mobile forms of knowledge and technology to the city – and often present as more embedded efforts that breakdown the boundaries between knowledge and its application (Evans, 2011).

In this context, 'alternative' is a generic term to encompass a range of 'retrofit' activities (efforts to purposively remake in some way) at sub-city scale and which may involve local activists, church groups, concerned neighbourhood groups and others. It also goes beyond the application of technologies to buildings or interventions in energy, water and waste systems to express much more broadly that (areas of) the city can be re-made through reconfiguring buildings, new forms of land-use and new ways of generating and conserving energy and other resources. Both dominant and alternative approaches to retrofit need to be better understood, as do, subsequently, the possibilities for productive relationships between them.

Given the potential variety of responses, how do we understand the remaking of the city? In this paper we examine 30 alternatives. Rather than look at alternatives across different cities, we do this within one metropolitan area, Greater Manchester in the UK, so that we can undertake analysis at the level of individual alternatives and the spatial politics of how they are made, and also consider the wider issue of the ways in which these individual initiatives re-make the city? That is to say, what do these initiatives add up to? Do they contribute to a view of remaking the material fabric of the city that is based on transformation or continuity with the dominant view and the interests that promote it? This article is about attempts to re-make the material fabric of the city and the role that space and its construction and contestation play in this. The key point is that, despite the intention to promote localist values and strategies as alternatives to dominant accounts of remaking the city, the hand of dominant interests is evident and critical in shaping 'alternative' strategies of response. This tension is illustrated through the development of a five-fold typology of alternative strategies in remaking the material fabric of the city.

We make our argument in four further sections. The next section sets out why the issue of remaking the material fabric of the city matters and why spatial politics and organisation are central issues. Section 3 develops a framework for researching multiple alternatives to dominant approaches to remaking the city. Section 4 focuses on Greater Manchester. It briefly sets out dominant efforts to purposively remake the city-region through a 'retrofit' agenda. 30 examples of alternatives to this approach in Greater Manchester are researched and analysed through the research framework and a five-fold typology of 'alternative' strategies for remaking the material fabric of the city, and the role of space in this, is developed. Finally, Section 5 assesses the politics, process and contestation of space through these 30 alternatives and the role of dominant state interests in setting the conditions (and thus conditionality) for these alternatives.

2. Why space matters in remaking the material fabric of the city

This section addresses the issue of why space matters in remaking the material fabric of the city. To do this, debates around making cities as eco-cities and remaking cities through retrofitting are unpacked and their conceptions of geographical space are laid out as are the relational, political spaces through which they are produced.

2.1. The dominant view of remaking

There has been the emergence in recent years of academic literatures that engage with the making and remaking of cities as a response to ecological challenges, particularly those posed by climate change and decarbonisation. At the forefront of these has been the emergence of the role of new eco-cities (Joss and Molella, 2013; Rapoport, 2014; Caprotti, 2014) and also of efforts to apply, or retrofit, many of the elements of eco-cities to existing cities (May et al., 2013; Eames et al., 2013). What is clear is that 'no commonly agreed definition has emerged to date' of what an eco-city is. This is not surprising given that the 'category's range of application is as wide as for instance: completely carbon-neutral and renewable energy supply; a well planned city layout and public transportation system; resource conservation; water and waste recycling; green roofs; restoring environmentally damaged urban areas; local urban agriculture; decent and affordable housing for all socio-economic and ethnic groups; improved job opportunities for disadvantaged groups; and voluntary simplicity in lifestyle choices...' (de Jong et al., 2015, p. 9).

The use of the term 'eco-city', from its emergence in the 1960s as part of the countercultural movement, has, though, shifted from a concern emanating from grassroots movements for keeping urban development within environmental limits to the creation of 'a comprehensive and transferable model of sustainable urban development' (Rapoport, 2014). The shift has been from bottom-up, small-scale responses predicated on a concern with ecological limits and social equity to an entrepreneurial, top-down view of eco-cities and the involvement of policy, corporate and architectural actors (Rapoport, 2014). This shift mirrors a narrowing within broader debates on urban sustainability where ecological and social justice concerns are squeezed in relation to economic priorities (Hodson and Marvin, 2014). This eco-cities agenda has also been differentially applied to existing cities through the development of the so-called retrofit agenda.

This is not to say that eco-cities and retrofit can only be understood in this way but that this is a dominant way of characterising new cities as a technologically led response to economic, ecological and social pressures. It is a dominant way which also exhibits some scalar flexibility in its application to eco-cities, eco-towns, eco-blocks and so on (Hodson and Marvin, 2010). Essentially, this is a top-down perspective and therefore, ascribes views of geographical space which are produced through relational spaces of narrowly constituted, dominant interests, often involving national and city-scale state actors, corporations and international architectural practices. These relationships mediate economic, ecological and social priorities which often produce eco-city strategies that promote the entrepreneurial, economic benefits of eco-cities in ways which appear to trump ecological and social justice concerns.

These concerns noted, eco-cities and retrofit of existing cities are seen as sites of experimentation and innovation (Rapoport, 2014). This needs to be understood as a form of meta-characterisation given the range of projects that seek to re-make the city. The breadth and growth of the activities that can be identified within these categories has been recognised and detailed (Rapoport, 2014; Joss and Molella, 2013), and the considerable efforts to naturalise and institutionalise this way of seeing the retrofit agenda as being the domain of large global cities and corporations through the C40 group of leading world cities has been illustrated (Acuto, forthcoming).

This making or remaking the city is presented as a way of contributing to sustainable urban development goals. In particular this involves reduction of carbon emissions through new forms of building standards and construction materials or through reconfiguring the built environment (for example with cavity wall and loft insulation), and by layering new energy networks (for example, district heating or on-site renewables) alongside existing supplies. Underpinning these goals is an efficiency strategy, where designing a new city or retrofitting the built environment and its networks is about saving carbon and producing new forms of energy to enhance growth through more efficient use of resources. The prioritisation of economic over social and ecological justice that is characteristic of such strategies positions the development of eco-cities and retrofitting cities as a market opportunity, where cities and the neighbourhoods within them become the test beds and sites for experimentation, attempting to make markets for ecological and retrofit products (Hodson and Marvin, 2013).

Seen in this way the development of eco-cities and the retrofitting of existing cities are about the constitution and mobilisation of political power. Narrowly constituted coalitions of interests develop plans that often 'do not include any discernible role for the future population in either the current development process or the future governance of the new city' (Joss and Molella, 2013, p. 128), where 'a particular kind of technological urbanism' is built on a 'particular conceptualization (with reference to circular ecosystem models used in ecological sciences) of the city as a scientifically determined, measurable, and controllable urban technological system' (Joss and Molella, 2013, p. 133). The effects of these initiatives, whilst often being concerned with the development of eco-enclaves, are predicated on new interdependencies and relationships with their hinterlands which may be less ecologically-sensitive (Hodson and Marvin, 2010; Joss and Molella, 2013).

2.2. Developing alternatives

Though these top-down views of remaking the city are dominant, particularly in policy debates, there are various alternatives that emanate from more bottom-up views. The *manifestation* of

alternatives, as different ways of accomplishing alternatives to dominant ways of re-making the city, have been highlighted and characterised as experiments and seen as purposive ways of seeking to reconfigure urban socio-technical systems. Urban climate change experiments are new forms of political space that assemble public and private interests and the reconfiguration of infrastructure networks (Castán Broto and Bulkeley, 2013). Such experiments are concerned with the reconfiguration and maintenance of ecological and economic flows and the ways in which the socio-technical organisation of infrastructure networks mediates this and contributes to debates around the metabolic circulation of material flows developed in urban political ecology writings (Heynen et al., 2006). Experiments are ways of understanding the manifold ways in which mobile, 'replicable' models of urban response meet with context and the ways in which both context and model are reconfigured. As James Evans has pointed out: 'Squaring the place specificity of experiments with demands for abstract (place-less) knowledge is an inherently geographical tension' (Evans, 2011, pp. 225–226). Such a view of an envisaged transformation of the city and its relationship to a particular city resonates with arguments developed by those working in the area of socio-technical niches. In particular, this tension can be understood in terms of whether models of change envisage that a city or part of it is stretched and transformed through experiments to reconfigure urban socio-technical systems or whether a city context fits and conforms to such models of change (Smith and Raven, 2012; Raven et al., in this issue).

This is important because it tells us something about power relations between those promoting (managerialist) models of eco-city and retrofit development and those promoting (locally embedded) place-based development. It also opens up the issue of the extent to which the circulation of economic and ecological flows are maintained or re-configured; the extent to which a 'metabolic adjustment' takes places and the experiment re-works flows, embeds them in context and in doing so brings together concerns with resource securitisation and also land and space (Castán Broto and Bulkeley, 2013). Thus rather than ascribing space it is more organically constituted through political struggle and negotiation. It politicises the production, maintenance and reconfiguration of space, resource flows and infrastructure networks.

The multiplicity of experiments and their constitutive and political elements raises the possibility of many different ways of conceiving of alternatives to dominant debates on remaking the city. What is common amongst many alternatives is the idea of localisation or relocation to address the economic, ecological, social and political challenges posed by globalisation and neoliberalisation (Mason and Whitehead, 2012; North, 2010). Localisation often prioritises locally embedded viewpoints, resources and capabilities. Fundamentally, this is a challenge to growth-based development, the privatisation of politics and liberalisation of economies. Radical views of local economies are presented that run counter to economic development as promoted by elites and that promote an intentional localism based not on ideologies of profit maximising and efficiency but on seeking to meet needs locally where possible – via a relative rather than total self-sufficiency (North, 2010). This means diverse economies that are controlled locally and that promote community and local ownership, cooperatives, local food production, local energy generation, common land ownership and so on. Localisation views such as these are re-scaleable to, for example, the level of co-housing communities (Chatterton, 2013).

Central to localisation is a view of the political shaping notions of what constitutes a 'good society' (North, 2010). Localisation promotes community power as means of addressing local needs. The variability of responses suggests that, rather than a movement, it is more helpful to characterise relocalisation and groups within this, such as Transition Towns groups, as a convergence space (Mason and Whitehead, 2012). Though we have characterised the notion of dominant and alternatives, above, it is important to emphasise that rather than these being bounded and fixed that empirically it is helpful to recognise the dynamic relationships between dominant and alternative approaches and what this produces.

2.3. *The dynamics of dominant and alternative*

From a localisation point, of view remaking is about re-evaluating and re-valuing urban spaces and the political communities that constitute them and also about contributing to wider change. So,

‘while prioritising urban spaces as arenas for integrated social change, self-mobilising elements of civil society are cast as the key agents of metropolitan and global change’ (Mason and Whitehead, 2012, p. 502). This is important as it develops a sense of relational space ‘within’ and between places; one which is built on a relational ethics of place (Mason and Whitehead, 2012) rather than the eco-competitiveness of neoliberal urbanism. This poses a challenge: that is to recognise the potential for such external relationships to not only be the basis of building transformational capacity but also as being the basis on which continuity is structured and on which resistance to change may be built. This may be the case, for example, in the relationship between building place-based capacities and governmental and political support:

Our point is, though, that often it is at the level of the *administrative unconscious* that political resistance to new ethical visions of place-making get expressed. Such structures of place inertia enable existing political authorities to ostensibly support progressive local initiatives without necessarily enabling them to substantively change the socio-economic fabric of place (Mason and Whitehead, 2012, p. 510, original emphasis)

This point raises issues about the relationships that constitute the political space of an alternative and also scaling up these relationships between alternatives (Seyfang and Smith, 2007). It also suggests the likelihood that relationships of dominant interests to alternatives could be one built on continuity rather than one of contributing to transformative capacity. For example, counter to the embedded intent of intentional localism we see the policy promotion of resilience. Rather than questioning crises resilience, for its policy advocates, ‘emphasises the need for individuals, communities or cities to simply get on with adapting to them [crises]’ (Evans, 2011, p. 224). Thus in constituting initiatives that have the intention of building localisation but which build relationships beyond their immediate context, particularly with state actors, there is the potential for tension. It is potential rather than something that will necessarily happen. To assess the extent of the tension we need to understand the different ways in which initiatives that seem to be alternatives seek to reconfigure geographical space through constituting political, relational spaces. It is to this which we now turn in developing a framework for research.

3. A framework for researching the role of space in ‘Alternative’ ways of remaking the city

What we have sought to highlight is that alternatives are constituted variably in practice and that within the construction of space and the tension between place-based localism and ‘external’, often state, actors it is important to understand this constitution. In this section we develop a framework for research to address the variety of ways in which alternatives are expressed and how we understand the role of space within this. We propose a framework that addresses the relationship between five issues: (1) what is being made/re-made materially; (2) what the dominant economic, ecological and social pressures are to which initiatives are responding; (3) how geographical space is represented through the initiative; (4) how the relational space of social and technical relations is configured or assembled; and (5) what the relationship is between aspirations of initiatives for transformation and continuity through relationships with state actors and others.

This framework synthesises literatures from urban studies, state and space, urban sustainability (Brenner et al., 2011; McFarlane, 2011; Flint and Raco, 2012) and socio-technical niches (Smith and Raven, 2012). These are framed within an approach that draws on geographical contributions to debates on space. Particularly it uses Doreen Massey’s (2005) idea of representational space and David Harvey’s (2006) development of relational and relative elements of space as a means of organising the synthetic framework.

The aim of the framework is to interrogate 30 initiatives which we characterise as alternatives. The research design used in this study followed a qualitative, exploratory approach (this is discussed in Burrai, 2014). From an initial 60 initiatives a total of 30 across Greater Manchester were identified and researched through a combination of Internet searches, initial categorisation, project selection through project team meetings, the design, development and completion of a research proforma for the

30 initiatives and thematic analysis.¹ The initiatives focus on reconfiguring land-use, the development of new networks, retrofitting buildings or on combinations of these as different ways of materially remaking the city.²

¹ The 30 projects identified were organised in a spreadsheet document which had initially five columns divided in name of the project or organisation, contact details, postcode, URL, description and reasons why the project existed. However, after a preliminary check, other 2 columns were added to clarify the selective process. These were the 'retrofit' element (i.e. what makes the projects transformative) and the 'alternative' aspect which characterise the projects (i.e. what makes the selected project alternative).

In identifying these projects, the first keywords entered in the search engine Google were 'retrofit projects in Greater Manchester'. In general, the results that this search produced were mainly linked to public institutions, such as the local councils or the national government, or to private companies and individuals who worked in sustainable retrofit, such as consultants, architects and renewable energy companies. The word 'alternative' was missing from the first search, however, in a second stage, the association of the complex terms 'retrofit' and 'alternative' did not show useful results for the purposes of the research. A working definition of retrofit and alternative was sought at this stage in order to keep consistent in the research but also to find a range of other keywords which could have produced interesting results. Therefore, retrofit, in this context, referred mainly to projects which were materially transformative whereas the word alternative encompassed initiatives which were organised and developed by local residents or, more in general, by community groups. In the light of these considerations, the word retrofit was removed from the search and the word alternative was left and associated to easier and more common terms. Hence, 'alternative projects Manchester' and 'alternative/shared energies' gave more results connected to local communities' initiatives. From these results there was further 'snowballing' of keywords to include 'community', 'eco', 'sustainable', 'shared', 'cooperative', 'social', 'restoration' and 'green'. These words were, afterwards, combined with others, such as 'eco-buildings', 'social housing', 'social centres' and 'social enterprise'; community-owned/shared energies' but also 'community-owned village shops'; 'sustainable projects'. The reasons why some projects were not considered valuable for this research were mainly two. They had to be alternative and retrofit, or transformative. Some projects were dismissed because they were not developed or they did not have any involvement of local communities or grassroots organisations, and, therefore, they were not considered alternative.

Once 30 projects were identified, 30 proforma documents, one for each project, were completed. The proforma aimed to address the issues: 'why does the retrofit project exist' and 'understanding the retrofit activity'. These issues included a series of sub-questions which intended to reconstruct, in more detail, the narrative behind each project.

This phase during which the proformas were completed unavoidably involved not only constant reflection but also a degree of subjectivity in the interpretation and re-construction of the storyline behind the projects analysed. We acknowledged, throughout the research process, that the account provided in each proforma was just one 'story' among an unlimited number of possible different stories (Denzin, 1997). As with respondents' accounts, web accounts were not always transparent. Therefore, subjective reinterpretations of the researched had a fundamental role in giving meaning and representing the formation and development of alternative projects. In relying on an interpretative approach to build reliable accounts of the projects we had to apply 'a high degree of reflexivity and awareness about the epistemological, theoretical and ontological conceptions of subjects and subjectivities that bear on our research practices and analytic processes' (Mauthner and Doucet, 2003, p. 424). To address this the research team met regularly to discuss, question and revise the choice of projects, the categories of the proforma, and the material contained in them. The research team also used the same process of regular meeting, discussion and questioning to restructure the proformas using the headings from the five-step methodology, set out above. This was then organised into an analytical table.

To sum up, the data analysis process followed three stages. Firstly a detailed understanding of the projects and the way they developed was built through the use of proformas. Here detailed information on each project was collated in a pre-defined document which aimed to discuss why retrofit projects exist, which types of retrofit activities develop, who is involved and why.

In the second stage the details reported in the 30 proformas were organised in an analytical table. The table was structured in 7 columns. The headings reported in the columns were pre-determined and followed a similar content used in completing the proformas:

- (a) Why the project exists;
- (b) Who are the actors involved;
- (c) Who started the project;
- (d) What has been retrofitted;
- (e) What is alternative;
- (f) Outcomes of the project (space);
- (g) Set of emerging themes.

Finally, analysis of the thirty projects was aligned with the five-step methodology through the re-development of the analytical table and the revision of the material within this through regular project team meetings.

² Buildings are the obvious physical entity that can be retrofitted. Two broad concepts of 'network' were used to identify alternative retrofit examples. First, a network is characterised as a physical framework that can be said to link or hold buildings, or places, together. These include, for example, district heating systems, cycle tracks, rivers and canals. The second use of 'network' is less tangible and describes a group or network of people with a shared interest, for example setting up a community energy project. Land-use for alternative retrofit is generally land, for example school and community gardens or orchards, and space on roofs for community-owned solar panels.

3.1. Research framework

The research framework is organised in terms of five themes.

1. In dominant accounts of remaking the city technologically informed change is central and active conceptions of context are often weak. Eco-city and retrofitting accounts generally focus on the top-down application of new energy, water, waste and transport technologies. Techno-economic accounts lend themselves to narratives of 're-engineering' and the amenability of cities as sites for such 'application' and 'innovation'. Some of the intellectual ballast for top-down views of remaking the city may, indirectly, come from proponents of the 'urban age' thesis 'which appears, in short, to have become a de rigueur framing device or reference point for nearly anyone concerned to justify the importance of cities as sites of research, policy intervention, planning/design practice, investment or community activism'. Here, blame can be attached to the 'persistence of stubbornly entrenched spatial ideologies that treat the urban as a pre-given, self-evident formation to be investigated or manipulated' (Brenner and Schmid, 2014, p. 749). History and process are often missing from actions where application and implementation are prioritised and rather than take the elements that are being re-made as pre-determined, we ask which elements of the city are being re-made?
2. This material remaking needs to be understood as a response to wider economic, ecological and social pressures. The key question here is, in materially remaking the city what economic, ecological and social pressures are being responded to? A set of 'generic' pressures press down on responses. It is important to articulate which pressures are interpreted by alternatives as being important in determining responses. These pressures relate to how we see the city not just materially but socio-materially and the ways in which this can be framed. There are numerous different understandings and political mobilisations of 'local' and 'localism', and it is important to address how political understandings of these are mobilised in re-shaping the material fabric of the city: whether, for example, there are national pressures for austerity localism, strategic municipal or metropolitan views of the local, or embedded views of the local from voluntary and community groups. Each implies a politics of the local that is not reducible to the 'container' of the local but is understandable through the multiple configurations-across scales and social interests – that produce locales and localisms.
3. The manifestation of these issues can be understood through how they represent geographical space (Massey, 2005). That is to say, a desire or a need to remake part of the city, and the ways in which pressures are interpreted informs a response which is represented through language and images which articulate an explicit or implicit characterisation of geographical space. This can be seen through plans, maps, schemes and various images which present the relationships of remaking geographical and material parts of a city. They perform a political function in bringing some 'fixity' or 'absolute' view of geographical space which reduces the complexity of efforts to remake the city to a number of signifiers. In doing this its power is in masking the complex relational politics that produces a simpler, often static and discrete view of geographical space that aims to produce a way of representing geography rather than representing multiple geographies. In this sense geographical space may often be represented as singular and static.
4. This requires an understanding of the relational and dynamic politics which produce geographical space and of the socio-technical elements, things, people, resources and their configuration and assembly. Socio-technical researchers have developed the concept of a niche to understand the ways in which promising socio-technical innovations are constituted through actor-networks, are learned about but also the extent to which they are protected through shielding, nurturing and empowerment (Smith and Raven, 2012; Raven et al., in this issue). Urban geographers have mobilised the concept of assemblage urbanism around which there has been a lively debate (McFarlane, 2011; Brenner et al., 2011) with the view that there is no single 'assemblage urbanism' (Brenner et al., 2011). 'Urban theory, assemblage thought asks how urban 'things' – including, quite appropriately, the urban itself – are assembled, and how they might be disassembled or reassembled' (Brenner et al., 2011, p. 228). We are interested here in the processes through which socio-technical alternatives are assembled, experimented with or protected and the actor-networks

that constitute them. But, beyond that, we situate processes of assemblage in a wider political economy (the 'pressures' set out above). We do this to provide a context to understand the resonance of particular assemblages beyond describing their constitution and to analyse the 'generic' pressures and how the assemblage interprets these pressures. That is to set out not only the way the assemblage of socio-technical elements is organised but also which interests (particularly whether state or embedded local interests) within it promote which (economic, ecological and social) agendas.

5. Finally, the research framework includes the extent to which initiatives that seek to be alternative to mainstream efforts to remake the city are and can be alternative. We ask, as part of a process of assembling the alternative, what it is that is being transformed? And what parts of the assemblage promote continuity? In particular, what is the nature of the relationship between top-down interests and those more locally embedded interests? This can be captured as the tension between outsider, more managerialist views of actor-network and niche development and more generative forms of such development (Smith and Raven, 2012).

We use this framework to examine alternative approaches to remaking the material fabric of Greater Manchester.

4. Remaking Greater Manchester? Dominant and alternative approaches

Formal city authorities frequently develop strategies and route maps for retrofitting the physical environment of the city. This is largely recognition of the contribution that buildings and the services that power them make in the production of carbon emissions. However, as can be seen from analysis of formal policy efforts to retrofit the built environment in Greater Manchester, this can be characterised as an agenda that works to re-enforce dominant governance and economic development priorities in the metropolitan area.

The emergent dominant pathway for remaking the material fabric of Greater Manchester is a national/city-regional policy- and business-led view of the relationship between Greater Manchester and retrofit which is 'top down' (Hodson et al., 2012). Additionally, since May 2010, the strategic landscape for retrofit is one of austerity and sub-national restructuring, underpinning the intensification of geographical competition. Within this context, Greater Manchester's plans for a retrofitting agenda are evident in the draft GM [Low Carbon Housing Retrofit Strategy \(2011\)](#).

To summarise, the dominant formal approach to retrofit in Greater Manchester is: top down; promotes primarily economic development and positioning; sees national priorities and local capacity and priorities in asymmetric relation; is concerned with making retrofit markets and demonstrating national priorities that are produced through narrowly constituted elite governance; where there are challenges of translating the agenda into embedded capacity; and where there is oscillation between spatial representations of 'Greater Manchester' through formal governance arrangements and various representations at a sub-metropolitan level through low carbon economic areas, living laboratories, corridors and zones.

4.1. Five 'types' of alternatives to the dominant approach

In contrast to the dominant retrofitting approach, there are a wide range of 'alternative' remaking initiatives in Greater Manchester which emanate within localities and neighbourhoods rather than being part of top down schemes. This section outlines a conceptual typology of five different ways of understanding the role of alternatives in remaking the material fabric of the city. The typology is based on the 30 identified initiatives (detailed in [Table 1](#) – fuller discussion of these examples can be found elsewhere (Burrai, 2014; Hodson, 2014)).

The material generated was subjected to review by the three authors in a series of review meetings. These initiatives were reviewed in relation to five categories of the research framework and a thematic analysis was developed. Five 'types' (see [Table 2](#)) are set out below where the types are organised in relation to the five categories and where the distinction between the types is on the basis of their

Table 1

30 Greater Manchester retrofit alternatives in summary.

Project	Summary
Incredible Edible Beer Garden	Transform unused pub garden to introduce the local community to sustainable horticultural practices and to demonstrate the feasibility of local food production.
Fallowfield Loophole	An urban rail trail, cycle track and bridle path that follows the 8 mile route of the Fallowfield Loop railway line.
Stockport Hydro	Generating community-owned hydro-electric energy on the river Goyt near Marple to power about 60 homes.
Saddleworth Community Hydro	Community-owned high head hydro scheme generating electricity for approximately 45 houses.
Reddish Vale Country Garden	Local authority and volunteer group-led community garden with green roof and solar PV in the garden.
Trafford Eco-house	An experiment in sustainable living, set in an inter-war detached house in suburban Sale.
MESS	Emerging from local church group, to create awareness – build carbon reduction responses in Marple, Mellor & Marple Bridge.
The Urban Gardening Project	From September 2011 organising community gardens, experimentation with permaculture and organic growing techniques.
5 Oaken Clough Terrace	A conservation experiment for a wide variety of wildlife to exist and develop.
Chorlton Refurb	A community organisation building local understanding of how to achieve more energy efficient homes.
IDEA	Founded 2006 by church members it raises local/global environmental awareness via projects in the Davyhulme area of GM.
Manchester Cathedral	In 2013, became the first cathedral in England to be heated by ground source heat pumps.
Bridge 5 Mill	Retrofitted 5 storey mill in Ancoats that provides a focal point for debate and action around sustainability.
Erneley Close	Claimed to be the first large-scale application of the Passivhaus principle in the UK to already existing buildings
Passivhaus	An engine house museum that installed a 198KW biomass boiler and heat system in the summer of 2013.
Ellenroad Engine House	Installed solar PV panels on a church roof to generate electricity for the adjacent community centre.
St John's Sunshine	In 2010, a green roof was installed on the Whitworth Art Gallery in Manchester.
Green Roof Project	Launched 2010 to work with local communities to create green roofs on small, communal buildings and structures.
Little Green Roofs	A volunteer led initiative set-up in 2012 to improve the appearance and the ability to enjoy the Rochdale canal.
Ancoats Canal Project	A volunteer-run arts centre in Delph, Saddleworth installed 4 kW of solar PV panels.
Millgate Arts Centre	Initiative to develop a carbon neutral community building that promoted community renewables.
Affetside Millennium GTCV	Pilot volunteer network to engage with householders via energy advice and understanding of energy usage.
Energy Academy Pilot	A member-based approach to sustainable woodland management in Greater Manchester.
Tree Station	An initiative to develop more formalised structures for bringing community energy groups together.
Fuelling Manchester	GM charity that supports local, practical action to address sustainability issues and climate change, since 2004.
Action for Sustainable Living	Established in 2000 on a local housing estate – a community garden occupies the site of an old road.
Leaf Street Community Garden	Contributing to decarbonising GM, reducing energy consumption, collective ways to purchase low carbon technologies.
Carbon Coop	Project that attempts to expand community food growing into community energy generation.
Didsbury Greening and Growing Group	Project to improve the beauty, biodiversity, fragrance, colour and sustainability of the city.
Urban Gardening Project	Local co-operative of volunteers developing a community owned hydro energy project in the town of Bury.
Bee Sustainable	

overarching purpose. We recognise that there are clearly overlaps between these different types. Future work would helpfully explore not only what these different types add up to in relation to efforts to transform particular places but also develop ways of understanding the interrelationships of these different types.

Table 2
Typology of 'alternatives'.

Type	Examples	Remade materially?	Dominant pressures	Geographical space	Relational space	Continuity or transformation?
Re-scaling and Recirculating Energy Generation To generate clean energy. Through local, democratic control. For community benefits.	Bee Sustainable; Affetside MGTCV; Stockport Hydro; Millgate AC; Mcr Cathedral; St John's Sunshine	Rivers, weirs, community arts centre and library, listed cathedral building, church roof	Forms of local democratic control. Ecological concern. Funding maintenance, repair of buildings, systems	Usually represented as a project – where, for example, hydro projects are situated on a weir or projects at the level of buildings. The geography of benefits are intended for a wider local community or town	Initiated by local transition groups, or key individuals, volunteers. Cooperatives; specialist energy charities; architects; archaeologists, engineers, contractors. Community buildings, churches, rivers, weirs, roofs; PV, hydro. Stitching financing from community sources and national schemes.	Transformation of scale, circulation of energy generation and flows of revenue; new forms of social organisation. Continuity through overlap with policy spaces and funding – reliance on planning processes.
Developing Sustainability Awareness and Engagement To promote sustainability and carbon reduction. Creating awareness to build local responses	Energy Academy; AfSL; Carbon Co-op; Fuelling Mcr; IDEA; MESS; Chorlton Refurb; Bridge 5 Mill	Raising awareness – focus on buildings and the activities that go on inside buildings through 'retrofitting' insulation and new energy generation technologies	Climate change, decarbonisation and wider sustainability. Limited capacity to act.	Focused at various geographical scales – building awareness at Greater Manchester level, towns within Greater Manchester, neighbourhoods and streets as well as communities of interest.	Initiated by various – from concerned environmentalists to church groups and established community groups. Environmental charities and coops, church projects, local sustainability groups, strong role for volunteers. Training. Film shows, energy fun days, Eco house demonstrations. Ongoing stitching of small amounts of EU and national funding.	Transformation is through building local awareness and response. Continuity – blurring of boundaries between local priorities and delivery of national programmes – dependence on small funding for survival.
Building Local Green Infrastructure To contribute to ecological and social benefits. Local food growing. Encouraging local volunteering. Reclamation of shared local spaces	IEBG; Reddish Vale CG; Little Green Roofs; Green Roof; Urban GP; Didsbury GGG; Leaf Street CG	Small, uninhabited, communal buildings and structures around Manchester; reclamation and re-use and re-valuing of local land	Ecological – rising temperatures; building local resilience; increasing biodiversity; Demonstrating responses to sustainability and CC. Reducing energy costs	Initiatives are scattered about Greater Manchester – include community centres, places of worship, colleges, schools, allotment societies and health centres, Art gallery, local squares, housing estates	Different modes of organisation. (a) Publically funded agencies and community partnerships. (b) Resident-driven. LAs working with 'Friends' groups, localisation groups. Community gardening/growing. Involving volunteers, polytunnels, raised beds, Hardy sedum, potatoes, beans, herbs, bee hives, apple trees. Small funding from patchwork of small national and local grants.	Transformation is in the material use of land and buildings through many experimental forms of organising and governing. Continuity in the relationships between Friends groups and local authorities and also between public agencies and community groups.

Table 2 (Continued)

Type	Examples	Remade materially?	Dominant pressures	Geographical space	Relational space	Continuity or transformation?
Revaluing Industrial Infrastructure To transform dis-used industrial infrastructure into community infrastructures	Saddleworth Community Hydro; Fallowfield Loopline; Ancoats Canal Project; Ellenroad Engine House	Existing reservoir and hydro-drop system; Trans-metropolitan railway line; Local sections of the canal network; The engine house of an old cotton mill.	Alternative to a proposed local development. New uses for derelict infrastructure. Gentrification and physical appearance.	Different scales from: Reservoir to community energy system. Derelict railway line to green corridor linking diverse parts of the city. Local sections of national canal network. Community renewables at the building scale.	Wide range from local cyclists group, to individuals. Often volunteer-led, by a key individual or Friends group. Organised in multiple ways. Friends group with national agencies, LAs and private interests; Coop working with utility; volunteers/residents. Cycle route, reservoir, pipeline, National Grid, canal, tow paths, biomass boiler/heat system. Lattice national, community funding.	Transformation can be seen in the aspirations to create new spaces, with new meanings. Strong use alternative organisational forms. Continuity is through strong dependency on national mechanisms and funding to make this work.
Exemplars of Remaking Sustainable living experiments – design, standards, retrofit to reduce energy use – visible for others	Trafford Eco House; Ernley Close Passivhaus; 5 Oaken Clough;	A house or group of houses 'retrofitted' with significant insulation to reduce energy usage and new forms of energy generation as part of wider low carbon lifestyles	Strong personal values for lived sustainability. Experimenting with social housing in deprived areas to significantly reduce energy bills.	Developments are at the level of a house or a neighbourhood. They are intended to have wider resonance as exemplars of energy efficient housing	Commitment of an individual or individuals or LA/social landlord. Household sustainable living experiments and upgrading homes. Small (changing lightbulbs) to large (alternative heating systems) change, Passivhaus principle, social landlord, improving appearance, insulation. Small funding, more programmatic upgrades funded through landlord.	Transformation is important in its symbolic exemplification. It is also about making visible lived sustainability. Continuity comes from dependence on existing funding streams to develop at scale.

4.2. Type one: re-scaling and recirculating energy generation

This type is primarily concerned with bringing together three sets of issues: (1) the generation of clean forms of energy, particularly solar PV and hydro-power; (2) with new mechanisms of local democratic control, often through forms of cooperative organisation and community-based share offers, structures and decision-making process; and (3) for the economic benefits of new forms of energy generation, usually through national-level payments for selling electricity, to be recirculated into the local economy. There are various examples of this kind of approach that are either functioning in this way or that aspire to function in this way, though to stronger and weaker extents. These include: hydro initiatives such as Bee Sustainable and Stockport Hydro, solar PV developments including St John's Sunshine, Affetside Millennium Green Trust Community Venue and Millgate Arts Centre, and, to a lesser extent, the development of a biomass heating scheme at Manchester Cathedral.

Materially this involves the remaking of a variety of physical aspects of the city from the manipulation of rivers and weirs to community buildings, including community and arts centres and churches and their roof spaces but also the development of connections to the National Grid. In some cases, often churches, it involves efforts to materially remake listed buildings or buildings with archaeologically significant features.

These responses are often informed by a mix of pressures. Primarily these are global and local ecological concerns and the recognition of ecological problems as matters of social justice. The social justice element is usually some commitment to making an unspecified local contribution to reducing greenhouse gas emissions, also committing to a geography of place-based benefits where the benefits of new forms of energy generation are intended for a wider local community or town, where community funds are intended to recirculate revenue generated into the local economy. Frequently, though, this more ethically driven politics weaves together with concerns for the ongoing maintenance, repair and functioning of buildings and systems and accessing funding to do this, where national funding sources that promote renewable forms of energy generation are targeted.

In terms of geographical space, these interventions are usually represented as material projects in very localised settings from, for example, hydro projects being situated on a weir or projects at the level of individual buildings.

In terms of the constitution of relational space, these initiatives are frequently initiated by localisation movements or groups, key ecologically motivated individuals, and volunteers. They are usually organised as cooperative models, where the cooperative forms the crux of the initiative and often incorporating work with specialist community energy charities or companies, architects, archaeologists, mechanical engineers, bore hole contractors and so on as appropriate to the individual project. This social organisational element is woven together with material elements that include community buildings, churches, rivers, weirs, roofs, PV, and hydro technologies. They also involve stitching together financing from a range of sources that involves community share offers, funding through national schemes such as the Feed-in-Tariff (FiT), Community Renewables Fund, Trailblazer grants or local grants, and through more localised modes of episodic fundraising. The scale of these schemes usually ranges from a few thousand pounds to a few million pounds.

The consequence of these approaches in terms of whether they contribute to transformation or continuity will differ in specific circumstances, although there is generally an attempt or at least an aspiration to transform both the scale and circulation of energy generation and the flows of revenue that follow it. This is heavily reliant on new forms of social organisation. There are significant limits to this imposed by continuity with dominant agendas through reliance on national funding schemes and instruments and on local planning processes.

4.3. Type two: developing sustainability awareness and engagement

Alternative efforts to remake the material fabric of the city also take the form of aims to develop sustainability awareness and engagement and including efforts to bring together a promotion of sustainability and carbon reduction issues with creating awareness to build local practical responses. This highlights the framing of sustainability as a problem and a local response as positive, viable and visible.

This approach is illustrated in various projects including the Energy Academy Pilot, the work of Action for Sustainable Living, Carbon Co-op, Fuelling Manchester, IDEA, MESS, Chorlton Refurb and Bridge 5 Mill.

In terms of what is materially being remade, this requires a step prior to materially focused action where there is work to raise awareness and consciousness of climate change and carbon emissions as both a reference point and a means of generating momentum to address what can be done about it. For many of these initiatives this means a practical focus on buildings and the activities that go on inside buildings through 'retrofitting' insulation and the installation of new energy generation technologies and also to experiment with and illustrate new ways of organising retrofit among community groups that diverges from dominant, conventional approaches.

The pressures that inform these kinds of response are largely to do with an interweaving of the consequences of climate change, the need for decarbonisation to address this and the desirability for a wider lived sustainability. Fundamentally, the view is that this needs to be achieved through developing awareness of the problem and experimenting with the kinds of responses that may be necessary to be developed locally and individually. This signifies another pressure that informs these initiatives as the absence or limitations of appropriate local capacity to act.

In terms of the representation of space, the concern is an awareness of 'global' problems but these are given a local relevance. This local relevance is represented at various geographical scales – from building awareness at Greater Manchester level, to campaigns and projects in towns within Greater Manchester, at neighbourhood and street levels as well as in bringing together communities of interest.

The relational interests producing these representations are primarily various individuals and groups, ranging from concerned environmentalists to church groups and established community groups. As initiatives, they are organised in various ways but involve relationships between environmental charities, local church-based community projects, networks of local sustainability groups, actors and cooperatives, usually with a strong role for volunteers. The mechanisms and activities through which they operate are a broad menu including developing and training energy advice volunteers to engaging people on energy efficiency measures, the organisation of community film shows and energy fun days, the production of newsletters and environmental documentaries, and undertaking climate pledge campaigns. Materially there is an explicit demonstration mode associated with this type (e.g. Eco house demonstrations) in the installation of loft and cavity wall insulation and new boilers at individual, neighbourhood and at the level of shared communities of interest. These communities of interest are also brought together to reduce costs of these activities through pursuing collective buying of retrofitting material and services. This type, thus, exemplifies demonstration, installation and the need for connecting and brokering local social interests.

Developing sustainability and awareness and doing sustainability and awareness is a boundary that is at best blurred and often one which collapses. Depending on how these are configured means that different sources of relatively small funding are drawn upon. Some campaigns are long-standing and draw on a mix of EU and National Lottery funding, trusts, charity funding such as Comic Relief, but also local authority and national government funding.

The transformative effects of these projects are usually at the interface of building new forms of local capacity, to develop local awareness and locally relevant forms of response. Many of the groups promoting a project or initiative are dependent on small amounts of time-specific funding for their survival. This can often result in the search for new streams of funding being a means of implementing national programmes rather than local priorities—although there is frequently a negotiation between the two.

4.4. Type three: building local green infrastructure

Local efforts to build green infrastructure contribute to remaking the city on the basis of seeking to build ecological and social benefits. This often rests on a desire and plans to promote local growing of food that is based on encouraging local volunteering and social organisation and central to this is the reclamation of shared, often overgrown or derelict local green spaces.

There are numerous examples of efforts to build local green infrastructure from the Incredible Edible Beer Garden, to the Reddish Vale Country Garden and also the Little Green Roofs and Green Roof

Projects, the Urban Gardening Project, the Didsbury Greening and Growing Group and the Leaf Street Community Garden. Materially these initiatives often involve the remaking of small, uninhabited, communal buildings and structures around Greater Manchester which are given green roofs, and the reclamation, re-use and re-valuing of existing local land.

The initiatives are conditioned by ecological pressures, particularly a concern with rising temperatures, the need to building local resilience in terms of food production and, to a lesser extent, flood risk and also to increase biodiversity. These responses integrate broad ecological pressures with a localist concern with education and engagement based on demonstrating practical responses to sustainability and the climate change challenge, alongside pressures for finding ways to reduce energy and food costs.

In terms of the kinds of spaces these initiatives represent, they are generally small-scale concerns scattered about Greater Manchester. They include interventions on buildings such as community centres, places of worship, colleges, schools, allotments, health centres, art galleries, local squares and housing estates in what amounts to a wide and diverse range of small projects.

The relational production of these spaces is frequently initiated by local transition or relocalisation groups, or key, motivated individuals and volunteers. Led by these individuals or groups they are often relationally connected through different modes of organisation that include: (1) a mix of pre-existing publically funded agencies working with a range of community groups, with a strong role for partnership working. (2) There is also a strand of building local, green infrastructure that is resident-driven by 'alternative' environmental, social and community perspectives. And (3) local authorities, in an era of constrained capacity and austerity, are working with 'Friends' groups, volunteer groups, and relocalisation movements. These configurations are organised through activities such as community gardening and growing sessions and involve technologies and plants from polytunnels and raised beds to hardy sedum, potatoes, leeks, onions, beans, herbs, bee hives, apple trees and so on. These initiatives usually involve relatively small amounts of money from a few thousand pounds to tens of thousands for which funding is often a patchwork of small national and local grants.

The transformational aspects of these kinds of initiatives are often illustrated in the new material uses of land and buildings through many experimental local forms of organising and governing. Where there is continuity, this is clearer in the relationships between Friends groups and local authorities and also between public agencies and community groups.

4.5. *Type four: revaluing industrial infrastructure*

Remaking the city inherently means seeking to bring new value to something that exists. There are numerous efforts to remake the city through transforming dis-used industrial infrastructure into community infrastructures. This can be seen in diverse examples from: efforts to use existing reservoir and industrial pumping technology in a community hydro scheme (Saddleworth Community Hydro) to the building of a green cycling infrastructure corridor along an old urban railway line (Fallowfield Loopline), the physical revitalisation of urban sections of the canal network (Ancoats Canal Project), and finding new and renewable ways of powering an industrial engine house for a mill museum (Ellenroad Engine House). Materially this involves remaking an existing reservoir and hydro-drop system, a trans-metropolitan railway line, local sections of the canal network and the engine house of an old cotton mill.

The prevalent pressure here is local multiple attempts to find new uses for derelict infrastructures. The specific pressures that interrelate with this differ from project to project, though they tend to be local manifestations of bigger global challenges. For example, the Saddleworth Hydro scheme was envisaged as an alternative to a proposed local wind farm that was the subject of local opposition, and pressure for the revitalisation of the Ancoats canal can be understood in terms of the gentrification of the area and the perceived need for local action on the physical appearance of the canal.

Representationally these initiatives operate at different geographical scales from: efforts to intervene in the industrial use of a reservoir system and to rescale its use to a community energy system to a derelict railway line that creates a green corridor from the leafy south of the city through more socially deprived areas of the east of the city; and from local sections of a much longer canal, which in turn is part of a national canal network, to community renewables development at the building scale.

Consequently, the relational production of these spaces involves a wide range of groups from local cyclist groups, to individuals developing an alternative to proposed but contested local development and so on. They are often volunteer-led, but rely on the particular drive of a key individual or Friends groups. Their social organisation and configuration of elements are organised relationally in multiple ways. This includes Friends groups working as part of partnerships with national agencies, local authorities and private interests, but can also involve the formation of cooperatives, working with utilities and Community Interest Companies to implement schemes; partnerships of volunteers and residents with large charities; and combinations of Friends group working with metropolitan agencies as part of national government funded projects. The material assemblage is configured involving many elements including cycle routes, reservoirs, pipelines and gravitational systems, the National Grid, canals, tow paths, boiler houses, biomass boiler and heat systems. Inevitably the development of these different projects, bringing back to life and maintaining these infrastructures over time, involves a lattice of funding bringing together Lottery funding with local authority and private funding, community share issues and income from the national Renewables Obligation Certificates and Renewable Heat Incentive, heritage, national government funding and trust funding and volunteer fundraising

The transformative aspiration in these projects is often visible materially through the aspirations to create new spaces and new meanings from old infrastructures. There is also a strong use of alternative organisational forms to undertake these transformations. As with other types of alternatives there is continuity from a strong dependency on national mechanisms and funding to make this work.

4.6. Type five: exemplars of remaking

The presentation of alternatives in is an important symbolic exemplification of remaking the city. This is illustrated by initiatives such as the Trafford Eco-House, the Ernley Close Passivhaus and 5 Oaken Clough.

These exemplars of remaking are usually a house or a group of houses that are 'retrofitted' with significant insulation upgrades to reduce energy usage and that promote new forms of energy generation as part of wider low carbon lifestyles. They are informed by either strong personal values for lived sustainability or a strong commitment from a public agency to illustrate this.

The pressures that inform this exemplification are built on the ecological and economic commitment of an individual or small group of individuals or a local authority or landlord. They are a commitment to lived sustainability and carbon reduction but also to significantly reducing energy bills.

As geographical spaces these developments are represented at the level of a house or a neighbourhood. They are intended to have a wider geographical resonance as exemplars of energy efficient housing.

In relationally producing these spaces, they are best understood as either household level experiments in sustainable living or programmes of upgrading homes. At the individual household level they are organised as a small number of projects working in partnership with urban design and sustainability organisations, and with the validation of the local authority. They are organised at a neighbourhood level as a social landlord working with consultants to oversee the project, construction and environmental companies, architects, chartered quantity surveyors and specialist cladding companies. They bundle together a range of material changes from the small (changing lightbulbs) to the large (alternative heating systems), solar PV array, thermal store and woodburner, locally made triple glazed windows, external insulation, use of the Passivhaus principle, the role of social landlord, reduction in energy bills, improving appearance, colour cladding, systems of recycling heat from domestic appliances, improvements to windows and doors, flat roofs, and insulation of solid floors.

In terms of funding, individual responses involve small pots of funding generated through grants. Neighbourhood schemes generated by social landlords are usually part of larger (hundreds of thousands of pounds and sometimes millions) more programmatic upgrades to the building stock funded through social landlords' capital.

The transformative aspect of this type of initiative is related to its symbolic exemplification of how things could or should be in terms of a lived sustainability. It is about making visible lived sustainability. Continuity comes from dependence on existing funding streams to develop at scale.

5. Conclusions: transformation or continuity?

This article has addressed the material remaking of the city as a significant contemporary issue, examined through efforts to re-shape the physical fabric of Greater Manchester. In particular it has addressed the role of space in this remaking. Critically, what we wished to understand was whether 'alternative' aspirations to remake the city were transformative or whether they re-produced the dominant approach to remaking the city.

As a characterisation, dominant responses are largely top down, market-led responses, where governing is about enabling market activity and the attraction of investment through representation of retrofit as an opportunity. This is often promoted through existing governance frameworks and formal spatial understandings that mobilise retrofit activity to reinforce those views and reproduce continuity. Bottom-up initiatives are about making a variety of new spaces, often with variable forms of association and governance, through a range of activities.

There are, though, dynamics between dominant and alternative approaches and it is how we understand these and their effects in relation to the material re-making of the city that was a central aim of this paper. In doing this we developed a five-fold framework that was designed to acknowledge that these two approaches should not be understood as bounded, fixed and disentangled but as interrelated. The issue that follows from this is how are they interrelated and with what effects? To research this we set out a five-fold framework to research how (claimed) alternative approaches to re-making the city could be understood in context. That is to say, what was it that was claimed to be being re-made and what was alternative about it? We also recognised that these claims were interpreted through wider societal economic, ecological and social pressures and that alternatives were not conceived in 'voluntaristic' terms but were conditioned by interpretations of the possibilities and constraints afforded by these pressures. These interpretations conditioned alternative responses that we understood representationally in terms of the intertwining of scales of activity and the kinds of activities that took place at those scales. These spatial representations were produced by a range of relational configurations that included combinations of national and local interests, forms of finance, technology, temporal horizons and forms of knowledge.

Analytically, from 30 cases we developed a five-fold typology. The typology was used as a mechanism to demonstrate a degree of coalescence – in relation to the issues above – among groups of the 30 cases. In this respect, the cases coalesced with the type of closest fit. The types are intended to demonstrate different ways in which alternative ways to re-make the city can be understood and the rich, complex and dynamics contexts of their production. Additionally, these overlap and a number of the 30 cases resonate with more than one type – though they have been located in the one with which they show the strongest affinity. The typology also shows the various roles that 'dominant', often state, interests play in a variety of alternatives from funding, to the creation of instruments.

Transformation is imagined in a number of ways: in the circulation of material resource flows (energy, finance, water); in the levels of local environmental awareness; in the cultural and material use assigned to existing buildings and lands; and in the way that collective action is organised.

The types also show that not only are there complex dynamics between continuity and transformation but that there is ongoing negotiation in understanding what is to be transformed as well as there being similar negotiations with contexts of continuity in putting transformative aspirations into action (e.g. negotiating planning processes or existing funding streams). They also demonstrate that, although the transformational aspirations set out above across the variety of types are often sustained through continuity and engagement with dominant processes and actors, the processes through which this happens have to be accomplished and re-made differentially.

The significance of these complex dynamics is the exposure of a structural limit to 'genuine' alternatives that promote radical, localist intent, that are often counter to capitalist production processes, and that are predicated on voluntarism and minimal institutional support. The limit is in the dynamic that alternatives have with dominant motivations, processes and actors; where dominant

interests often operate as entrepreneurial vultures,³ positioning themselves to identify, mainstream and upscale alternatives in ways which, by definition, delocalises them. In seeking the financial support and knowledge of dominant interests, alternatives are likely to weaken both their radical edge and their local moorings through signing up to the generic priorities of dominant interests and thus reducing their own discretion to act.

The five 'types' of alternatives we developed are not intended to be exhaustive and we view these as an initial set of propositions to be refined, revised and added to through longitudinal, processual analysis that develops in-depth engagement with context.

Inevitably in undertaking this kind of work there is a tension between depth and breadth, which we were aware of. To be able to examine a breadth of examples required sacrificing some depth. This is understandable in the context of a journal article. We would encourage future research to work to understand these types in more depth through detailed case study work that both stretches and deepens understanding of alternative ways of remaking the city.

These initial findings suggest that there are many ways of organising space to remake the material fabric of the city. This is an emergent research area and our article highlights the need for more work on better understanding the range of alternatives and an examination of the interconnections and possible interconnections between alternative initiatives and formal priorities. At the crux of this issue is the politics of space and how space is constructed and contested to produce particular effects.

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